

# If You Choose Not to Vaccinate Your Child, Understand the Risks and Responsibilities.

Updated October 2010

If you choose to delay some vaccines or reject some vaccines entirely, there can be risks. Please follow these steps to protect your child, your family, and others.

## With the decision to delay or reject vaccines comes an important responsibility that could save your child's life, or the life of someone else.

Any time that your child is ill and you:

- call 911;
- ride in an ambulance;
- visit a hospital emergency room; or
- visit your child's doctor or any clinic

you must tell the medical staff that your child has not received all the vaccines recommended for his or her age.

Keep a vaccination record easily accessible so that you can report exactly which vaccines your child has received, even when you are under stress.

## Telling health care professionals your child's vaccination status is essential for two reasons:

- When your child is being evaluated, the doctor will need to consider the possibility that your child has a vaccine-preventable disease. Many of these diseases are now uncommon, but they still occur.
- The people who help your child can take precautions, such as isolating your child, so that the disease does not spread to others. One group at high risk for contracting disease is infants who are too young to be fully vaccinated. For example, the measles vaccine is not usually recommended for babies younger than 12 months. Very young babies who get measles are likely to be seriously ill, often requiring hospitalization. Other people at high risk for contracting disease are those with weaker immune systems, such as some people with cancer and transplant recipients.

## Before an outbreak of a vaccine-preventable disease occurs in your community:

- Talk to your child's doctor or nurse to be sure your child's medical record is up to date regarding vaccination status. Ask for a copy of the updated record.
- Inform your child's school, childcare facility, and other caregivers about your child's vaccination status.
- Be aware that your child can catch diseases from people who don't have any symptoms. For example, Hib meningitis can be spread from people who have the bacteria in their body but are not ill. You can't tell who is contagious.



## When there is vaccine-preventable disease in your community:

- It may not be too late to get protection by getting vaccinated. Ask your child's doctor.
- If there are cases (or, in some circumstances, a single case) of a vaccine-preventable disease in your community, you may be asked to take your child out of school, childcare, or organized activities (for example, playgroups or sports).
- Your school, childcare facility, or other institution will tell you when it is safe for an unvaccinated child to return. Be prepared to keep your child home for several days up to several weeks.
- Learn about the disease and how it is spread. It may not be possible to avoid exposure. For example, measles is so contagious that hours after an infected person has left the room, an unvaccinated person can get measles just by entering that room.
- Each disease is different, and the time between when your child might have been exposed to a disease and when he or she may get sick will vary. Talk with your child's doctor or the health department to get their guidelines for determining when your child is no longer at risk of coming down with the disease.

## Be aware.

- Any vaccine-preventable disease can strike at any time in the U.S. because all of these diseases still circulate either in the U.S. or elsewhere in the world.
- Sometimes vaccine-preventable diseases cause outbreaks, that is, clusters of cases in a given area.
- Some of the vaccine-preventable diseases that still circulate in the U.S. include whooping cough, chickenpox, Hib (a cause of meningitis), and influenza. These diseases, as well as the other vaccine-preventable diseases, can range from mild to severe and life-threatening. In most cases, there is no way to know beforehand if a child will get a mild or serious case.
- For some diseases, one case is enough to cause concern in a community. An example is measles, which is one of the most contagious diseases known. This disease spreads quickly among people who are not immune.

## If you know your child is exposed to a vaccine-preventable disease for which he or she has not been vaccinated:

- Learn the early signs and symptoms of the disease.
- Seek immediate medical help if your child or any family members develop early signs or symptoms of the disease.

**IMPORTANT:** Notify the doctor's office, urgent care facility, ambulance personnel, or emergency room staff that your child has not been fully vaccinated before medical staff have contact with your child or your family members. They need to know that your child may have a vaccine-preventable disease so that they can treat your child correctly as quickly as possible. Medical staff also can take simple precautions to prevent diseases from spreading to others if they know ahead of time that their patient may have a contagious disease.

- Follow recommendations to isolate your child from others, including family members, and especially infants and people with weakened immune systems. Most vaccine-preventable diseases can be very dangerous to infants who are too young to be fully vaccinated, or children who are not vaccinated due to certain medical conditions.
- Be aware that for some vaccine-preventable diseases, there are medicines to treat infected people and medicines to keep people they come in contact with from getting the disease.
- Ask your health care professional about other ways to protect your family members and anyone else who may come into contact with your child.
- Your family may be contacted by the state or local health department who track infectious disease outbreaks in the community.

## If you travel with your child:

- Review the CDC travelers' information website (<http://www.cdc.gov/travel>) before traveling to learn about possible disease risks and vaccines that will protect your family. Diseases that vaccines prevent remain common throughout the world, including Europe.
- Don't spread disease to others. If an unimmunized person develops a vaccine-preventable disease while traveling, to prevent transmission to others, he or she should not travel by a plane, train, or bus until a doctor determines the person is no longer contagious.

# VACCINE FAQ'S

## Q. How can parents sort out conflicting information about vaccines?

**A.** Decisions about vaccine safety must be based on well-controlled scientific studies.

Parents are often confronted with “scientific” information found on television, on the Internet, in magazines and in books that conflicts with information provided by healthcare professionals. But few parents have the background in microbiology, immunology, epidemiology and statistics to separate good scientific studies from poor studies. Parents and physicians benefit from the expert guidance of specialists with experience and training in these disciplines.

Committees of these experts are composed of scientists, clinicians and other caregivers who are as passionately devoted to our children's health as they are to their own children's health. They serve the Centers for Disease Control and Prevention ([www.cdc.gov/nip](http://www.cdc.gov/nip)), the American Academy of Pediatrics ([www.aap.org](http://www.aap.org)) and the Infectious Diseases Society of America ([www.immunizationinfo.org](http://www.immunizationinfo.org)), among other groups. These organizations provide excellent information to parents and healthcare professionals through their Web sites. Their task is to determine whether scientific studies are carefully performed, published in reputable journals and, most importantly, reproducible. Information that fails to meet these standards is viewed as unreliable.

When it comes to issues of vaccine safety, these groups have served us well. They were the first to figure out that intestinal blockage was a rare consequence of the first rotavirus vaccine, and the vaccine was quickly discontinued. And they recommended a change from the oral polio vaccine, which was a rare cause of paralysis, to the polio shot when it was clear that the risks of the oral polio vaccine outweighed its benefits.

These groups have also investigated possible relationships between vaccines and asthma, diabetes, multiple sclerosis, SIDS and autism. No studies have reliably established a causal link between vaccines and these diseases — if they did, the questioned vaccines would be withdrawn from use.

## Q. If the diseases that vaccines prevent are now rare, why should my child still get vaccines?



**A.** Although several of the diseases that vaccines prevent have been dramatically reduced or eliminated, vaccines are still necessary:

- *to prevent common infections.*

Some diseases are so common in this country that a choice not to get a vaccine is a choice to get infected. For example, choosing not to get the pertussis (whooping cough) or varicella

(chickenpox) vaccines is a choice to risk serious and occasionally fatal infections.

- *to prevent infections that could easily reemerge.*

Some diseases in this country continue to occur at very low levels (for example, measles, mumps and *Haemophilus influenzae* type b, or Hib). If immunization rates in our schools or communities are low, outbreaks of these diseases are likely to occur. This is exactly what happened in the late 1980s and early 1990s when thousands of children were hospitalized with measles and more than 120 died. Children were much more likely to catch measles if they weren't vaccinated.

- *to prevent infections that are common in other parts of the world.*
- Although some diseases have been completely eliminated (polio) or virtually eliminated (diphtheria) from this country, they still occur commonly in other parts of the world. Children are commonly paralyzed by polio in India or killed by diphtheria in Russia. Because there is a high rate of international travel, outbreaks of these diseases are only a plane ride away.

Atkinson W, et al. *Epidemiology and Prevention of Vaccine-Preventable Diseases*. 9th Edition. Centers for Disease Control and Prevention, U.S. Dept. of Health and Human Services, 2006.

## Q. Are vaccines safe?



**A.** Because vaccines are given to people who are not sick, they are held to the highest standards of safety. As a result, they are among the safest things we put into our bodies.

How does one define the word safe? If safe is defined as “free from any negative effects,” then vaccines aren't 100 percent safe. All vaccines have possible side effects. Most side effects are mild, such as fever, or tenderness and swelling where the shot is given. But some side effects from vaccines can be severe. For example, the pertussis vaccine is a very rare cause of persistent inconsolable crying, high fever or seizures with fever. Although these reactions do not cause permanent harm to the child, they can be quite frightening.

If vaccines cause side effects, wouldn't it be “safer” to just avoid them? Unfortunately, choosing to avoid vaccines is not a risk-free choice — it is a choice to take a different and much more serious risk. Discontinuing the pertussis vaccine in countries like Japan and England led to a tenfold increase in hospitalizations and deaths from pertussis. Recently, a decline in the number of children receiving measles vaccine in the United Kingdom led to an increase in measles hospitalizations and deaths.

When you consider the risk of vaccines and the risk of diseases, vaccines are the safer choice.

Plotkin, S, et al. *Vaccines*. 4th Edition, W.B. Saunders and Co., 2004.

## Q. Do children get too many shots?

**A.** Newborns commonly manage many challenges to their immune system at the same time.

Because some children could receive as many as 25 shots by the time they are 2 years old and as many as five shots in a single visit to the doctor, many parents wonder whether it is safe to give children so many vaccines.

Although the mother's womb is free from bacteria and viruses, newborns immediately face a host of different challenges to their immune systems. From the moment of birth, thousands of different bacteria start to live on the surface of the intestines. By quickly making immune responses to these bacteria, babies keep them from invading the bloodstream and causing serious diseases.

In fact, babies are capable of responding to millions of different viruses and bacteria because they have billions of immunologic cells circulating in their bodies. Therefore, vaccines given in the first two years of life are a raindrop in the ocean of what an infant's immune system successfully encounters and manages every day.

Offit PA, et al. Addressing parents' concerns: Do vaccines weaken or overwhelm the infant's immune system? *Pediatrics* 109:124-129, 2002.

## Q. Does the MMR vaccine cause autism?

**A.** Carefully performed studies clearly disprove the notion that autism is caused by the MMR vaccine.

Because the signs of autism may appear in the second year of life, at around the same time children receive certain vaccines (such as MMR), and because the cause of autism is unknown, some parents wonder whether vaccines might be at fault.

The vast weight of medical and scientific evidence now strongly refutes the notion that MMR causes autism. Studies of hundreds of thousands of children in the United States, the United Kingdom and Denmark found that children with autism were not more likely to have received the MMR vaccine, or to have received the MMR vaccine recently, than other children.

Four of the 14 studies that found that the MMR vaccine did not cause autism are listed below:

Taylor, B, et al. Autism and measles, mumps, and rubella vaccine: no epidemiologic evidence for a causal association. *Lancet* 351:2026-2029, 1999.

Dales L, et al. Time trends in autism and in MMR immunization coverage in California. *JAMA* 285:1183-1185, 2001.

Kaye JA, et al. Measles, mumps, and rubella vaccine and incidence of autism recorded by general practitioners: a time-trend analysis. *Brit Med J* 322:460-463, 2001.

Madsen KM, et al. A population-based study of measles, mumps, and rubella vaccination and autism. *N Engl J Med.* 347:1477-1482, 2002.

## Q. Do vaccines cause chronic diseases like diabetes, multiple sclerosis, asthma or allergies?



**A.** A wealth of evidence now confirms the fact that vaccines do not cause allergic or autoimmune diseases.

Most people get vaccines. Therefore, people with chronic diseases like diabetes, multiple sclerosis, asthma or allergies are likely to receive vaccines. Some of these people will receive a vaccine just prior to the first symptoms of their disease. The

question is, "How can you tell whether a vaccine caused a disease?"

The best way to answer this question is to perform a scientific study. For example, some people who smoke a lot of cigarettes get lung cancer. To determine whether cigarette smoking caused lung cancer, studies compared the incidence of lung cancer in people who smoked cigarettes to people who didn't smoke. The best studies matched these two groups of people with regard to age, general health, medications and so on. By matching these groups researchers made sure that the only difference between them was cigarette smoking. The result was clear — cigarette smoking caused lung cancer.

Similarly, some people who use cell phones get brain cancer. To determine whether cell phones caused brain cancer, the incidence of brain cancer in people who used cell phones was compared to people who didn't use cell phones. Again these groups were matched to make sure that the only difference between them was cell phone use. That result was also clear — cell phones didn't cause brain cancer.

By doing matched studies of people who did or did not receive vaccines, we now know that vaccines don't cause diabetes, multiple sclerosis, allergies or asthma. A publication that reviewed 93 studies examining the relationship between vaccines and chronic diseases is listed below:

Offit, PA and Hackett, CJ. Addressing parents' concerns: Do vaccines cause allergic or autoimmune diseases? *Pediatrics* 111:653-659, 2003.

## Q. Does thimerosal, a mercury-containing preservative, cause autism?



**A.** Thimerosal, an ethylmercury-containing preservative, has now been removed from all routinely recommended vaccines with the exception of the influenza vaccine.

Five studies performed on three continents clearly show that the incidence of autism was the same in children who received vaccines that contained thimerosal as in those who received vaccines that didn't contain thimerosal. The Institute of Medicine, an independent research organization within the National Academy of Sciences, reviewed these studies and concluded that thimerosal doesn't cause autism. Perhaps the best study, published in July 2006, took advantage of a natural experiment that occurred in Montreal between 1987 and 1998 when the quantity of thimerosal in vaccines varied. Between 1987 and 1991, vaccinated babies received 125 micrograms of thimerosal, between 1992 and 1995 they received 225 micrograms, and after 1996 they received 0 micrograms. If thimerosal caused autism, the incidence of autism should have been much higher in children born between 1992 and 1995 than in those born after 1995. In fact, the opposite was true; the incidence of autism was much higher in babies born after 1995 than in those born before 1995. Similarly, Denmark, a country that abandoned thimerosal as a preservative in 1991, actually saw an increase in autism several years later. This increase in autism rates was most likely due to a broadening of the definition of the disease to include Asperger's syndrome, autistic spectrum disorder and pervasive developmental delay.

Fombonne E, et al. Pervasive developmental disorders in Montreal, Quebec, Canada: prevalence and links with immunization. *Pediatrics* 118:139-150, 2006.

Hviid A, et al. Association between thimerosal-containing vaccine and autism. *JAMA* 290:1763-1766, 2003.

Andrews N, et al. Thimerosal exposure in infants and developmental disorders: a retrospective cohort study in the United Kingdom does not support a causal association. *Pediatrics* 114:584-591, 2004.

Herron J. Thimerosal exposure in infants and developmental disorders: a prospective cohort study in the United Kingdom does not support a causal association. *Pediatrics* 114:577-583, 2004.

Verstraeten T, et al. Safety of thimerosal-containing vaccines: a two-phased study of computerized health maintenance organization databases. *Pediatrics* 112:1039-1048, 2003.

## Q. Do vaccines contain additives?

**A.** Many vaccines contain trace quantities of antibiotics or stabilizers.

Antibiotics are used during the manufacture of vaccines to prevent inadvertent contamination with bacteria or fungi. Trace quantities of antibiotics are present in some vaccines. However, the antibiotics contained in vaccines (neomycin, streptomycin or polymyxin B) are not those commonly given to children. Therefore, children with allergies to antibiotics such as penicillin, amoxicillin, sulfa, or cephalosporins can still get vaccines.

Gelatin is used to stabilize live viral vaccines and is also contained in many food products. People with known allergies to gelatin contained in foods may have severe allergic reactions to the gelatin contained in vaccines. However, this reaction is extremely rare.

Offit, PA, Jew RK. Addressing parents' concerns: Do vaccines contain harmful preservatives, adjuvants, additives, or residuals? *Pediatrics* 112:1394-1401, 2003.

American Academy of Pediatrics. In Pickering LK, ed. *Red Book: 2003 Report of the Committee on Infectious Diseases*. 26th ed. Elk Grove Village, IL

# Influenza

also known as flu

## “Flu Can Kill Healthy Children”: A True Story

One Wednesday afternoon in late January 2004, 3½-year-old Emily Lastinger took an unusually long nap. Strep throat had been going around at her preschool, so Emily's parents, Joe and Jennifer, took her to the doctor the next day to make sure she was okay. A nurse did a nasal swab and discovered that Emily had influenza (the flu). Emily was given influenza antiviral drugs to treat her illness, and her parents were told to give her plenty of fluids to drink as well as a fever reducer.

By Saturday, Emily was sicker. Her fever rose to 103 degrees, and she began vomiting. “Even though Emily was obviously sick, she was well enough to be up with the family that weekend, watching TV, and playing a bit,” recalls Jennifer. “But we were worried and called the doctor a couple of times to talk about her symptoms and ask if we should come in to have someone look at Emily.”

The doctor reassured the Lastingers that Emily had typical flu symptoms and that they should keep trying to give her plenty to drink. Jennifer and Joe were told to bring Emily in on Monday if they were still concerned.

On Monday morning, Emily's parents made a doctor's appointment for that afternoon. “I gave Emily a bath and got her dressed,” says Joe. Then, Emily lay down

in her parents' room to rest. Fifteen minutes later, her mother found her lifeless on the bed.

Jennifer and Joe started CPR immediately. Soon paramedics arrived. Forty-five minutes later in the emergency room, doctors were able to start Emily's heart and quickly transferred her to a local children's trauma center. Doctors worked for 12 hours to keep her heart and lungs working, but Emily died that evening.

“A lot of thoughts go through your mind,” says Joe. “You think, ‘Little girls don't suddenly collapse and die.’ You think, ‘Parents don't go into the hospital with their child, and then leave without her.’”

The autopsy revealed that because of the flu, Emily had pneumonia with a painful complication called an empyema (infection of the lungs). Emily had not been vaccinated against the flu.

“The flu made the unthinkable real in our family,” says Joe. “And now we're committed to making sure that everyone knows one important truth: The flu can kill healthy children.”

“I could have gotten Emily the flu vaccine,” says Joe. “Whatever else you do, be sure to get your children the flu vaccine every year.” 🐼

## Flu is Not a Cold or a Stomach Bug

A mild case of flu can sometimes look like the common cold. But flu can be much more serious. In addition to fever, cough, sore throat, and runny or stuffy nose, flu can cause headache, muscle ache, and fatigue. And even though flu is not a stomach bug, children also can have nausea, vomiting, and diarrhea.

“Although most flu illnesses in children do not lead to complications, some can lead to ear infections, pneumonia, hospitalization, and in rare cases, even death,” says Dr. Carolyn Bridges of the Centers for Disease Control and Prevention (CDC). “By far, the best way to prevent influenza is by getting a flu vaccine. Every year, there are children who die of flu.”

Every year in the United States, even healthy children are hospitalized or die from flu complications. Millions of children get sick with flu each year, 20,000 children younger than 5 years old are hospitalized from flu-related causes and sadly, deaths in children from flu occur every year. From 2003-2004 to 2009-2010, pediatric deaths reported to CDC

ranged from 46 to 153 each year. During the 2009 H1N1 pandemic, more than 340 deaths in children were reported to CDC from April 26, 2009 to May 22, 2010.

## Flu Spreads Easily

People who have flu usually have a runny nose, and they cough and sneeze, which makes droplets with viruses in them. Other people can get the flu by breathing these droplets in their noses or mouths or touching surfaces contaminated with flu virus and then touching their noses or mouths.

“The best way for parents to protect themselves and their children from flu is to get the entire family vaccinated with flu vaccine every year,” says Dr. Meg Fisher from the American Academy of Pediatrics.

## Get a Flu Vaccine Every Year

Why should you get a flu vaccine every year? Flu season most often peaks in February, but flu viruses can continue to spread and cause illness until April or May. There are many different flu viruses, and they change constantly. For

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each season, a new flu vaccine is produced that is designed to protect against the three main flu viruses that are expected to cause the most illness during the upcoming season—the decision about which viruses to include is based on the best information available and the opinion of experts. The vaccine can protect against illness from the viruses in the vaccine, or it can make illness milder if people are exposed to a different but related flu virus. Another reason to get vaccinated every year is that the body's immunity from the vaccine decreases after a year, so your body needs a new vaccine to renew immunity.

## Who Should Get a Flu Vaccine?

Annual flu vaccination is recommended for everyone 6 months of age or older. Vaccination is especially important for parents, caregivers, and other adults who live with or come in close contact with children at high risk of getting very sick if they get the flu. Children at high risk include babies younger than 6 months (these babies are too young to be vaccinated), children 6 months through 5 years of age, and children or adolescents of any age who have certain chronic health problems such as asthma, heart disease, or neurologic conditions. "Making sure parents and children are vaccinated every year not only helps create a circle of protection around families—it also helps slow the spread of flu throughout the community," says Dr. Fisher. "Families should plan to get vaccinated against flu as soon as vaccine is available in the community."

### Benefits of Flu Vaccine

Getting the annual flu vaccine as recommended—

- Saves lives.
- Prevents hospitalizations.
- Protects young children and pregnant women, for whom the disease can be especially serious.
- Protects your family, especially infants, who are too young to get flu vaccine, and grandparents and other seniors who may live with young children.

### Risks of Flu Vaccine

- Side effects are mild and last only a few days. The flu shot can cause soreness, redness, or swelling in the area where the shot was given as well as low-grade fever and achiness. The nasal spray vaccine can cause runny nose, wheezing, headache, vomiting, muscle aches, and fever. Adults also may experience cough and sore throat.
- Moderate side effects, such as an allergic reaction, are possible, though uncommon.
- Severe side effects, such as a severe allergic reaction or a condition called Guillain-Barré syndrome, an illness associated with temporary paralysis, are rare.

## Flu Vaccine is Safe

Many studies over many years have shown that flu vaccine is safe. Flu vaccines are also effective. A number of studies have shown that the flu vaccine works, but how well the vaccine works can change from year to year and vary among different groups of people. The ability of the flu vaccine to protect a person depends on at least two things: 1) the age and health of the person getting the vaccine and, 2) the similarity or "match" between the virus strains in the vaccine and those being spread in the community. Mild side effects from the flu shot may include soreness, redness, or swelling where the shot was given, fever (low grade), or aches. Side effects of the nasal spray flu vaccine can include stuffy or runny nose. If they occur, these side effects last only a few days. Severe side effects are rare.

Some people are concerned about a preservative in vaccines called thimerosal. "Parents should remember that there have been many scientific studies showing that thimerosal in vaccines does not cause harm," says CDC's Dr. Anne Schuchat, director of the National Center for Immunization and Respiratory Diseases. While there is no scientific evidence that thimerosal is harmful in vaccines, a thimerosal-free influenza vaccine is available that people can request from their health care professional. ■

### Two Ways to Get Vaccinated Against Flu

**A**nnual flu vaccination is the safest, most effective way to protect both children and adults against serious illness caused by flu.

You can receive the flu vaccine two ways—as a shot or a nasal spray. All flu vaccine is made from flu viruses that are grown in chicken eggs and then purified.

The flu shot is approved for most people 6 months of age or older. The nasal spray vaccine is approved for healthy people 2 years through 49 years of age. Children with asthma or other medical conditions that increase their risk of severe influenza illness should not get the nasal spray vaccine. Also, children 2 years through 4 years of age who have had wheezing in the past year also should not get the nasal spray vaccine. Pregnant women need to get the shot, not the nasal spray vaccine.

Some children who are vaccinated for the first time may need more than one dose.

For example, children younger than 9 years old who are getting a flu vaccine for the first time need two doses spaced 4 weeks apart, so getting young children vaccinated early is important. Ask your health care professional about the flu vaccine that your child needs. 🐣

### Each Year, the Vaccine Protects Against Three Flu Viruses

**H**ealth experts in the United States closely watch flu activity around the world, and every February they decide which three flu viruses are most likely to cause disease in the upcoming flu season according to the most recent research. How well the flu vaccine works each year partly depends on how well the viruses in the vaccine match the viruses that are making people sick. Sometimes, the match is not perfect. But even in these years, vaccination still can help by making flu illness less severe. 🐣

#### Selected References

Centers for Disease Control and Prevention. Influenza. In: Atkinson W, Hamborsky J, McIntyre L, Wolfe S, eds. *Epidemiology and Prevention of Vaccine-Preventable Diseases (The Pink Book)*. 11th ed. Washington DC: Public Health Foundation, 2009. p. 135-155. <http://www.cdc.gov/vaccines/Pubs/pinkbook/default.htm>

Price, CS, et al. Prenatal and Infant Exposure to Thimerosal from Vaccines and Immunoglobulins and Risk of Autism. *Pediatrics*. 2010; 126:656-664. <http://pediatrics.appublications.org/cgi/reprint/peds.2010-0309>

*The Centers for Disease Control and Prevention, the American Academy of Family Physicians, and the American Academy of Pediatrics strongly recommend vaccines.*

**800-CDC-INFO (800-232-4636)**  
**<http://www.cdc.gov/vaccines>**

# Understanding MMR Vaccine Safety

➤ For more information on vaccines, vaccine-preventable diseases, and vaccine safety:  
<http://www.cdc.gov/vaccines/conversations>

Last updated July 2011

- CDC recommends two doses of the measles, mumps, and rubella vaccine (MMR) for children because it protects them against dangerous, even deadly, diseases.
- The MMR vaccine has a long record of safety. Serious risks of MMR vaccine are rare. All reputable scientific studies have found no relationship between MMR vaccine and autism.
- The routinely recommended age for the first MMR dose is 12 months through 15 months. The routinely recommended age for the second MMR dose is 4 years through 6 years.
- If there is an outbreak of measles, health authorities might recommend the vaccine be given at an earlier age.

However, there may be signs of autism before a child is old enough to get the first dose of MMR at age 12 months through 15 months. Because parents know their children best, they should become familiar with the developmental milestones that children should reach and when they should reach them, learning what to watch for in how children play, learn, speak, and act. These milestones can be found on CDC's Learn the Signs. Act Early website at <http://www.cdc.gov/ncbddd/autism/ActEarly/default.htm>.

Parents also should talk to their child's health care professional immediately about any concerns that may arise as they observe their child's development. By working together, parents and health care professionals can act early not only to identify developmental problems but also to take action to help children reach their full potential.

A second reason that some people think MMR vaccine may cause autism stems from a 1998 study published in the *Lancet* in the United Kingdom. One of the authors claimed that MMR vaccine could contribute to the development of autism. This study received a great deal of media coverage. It was followed by many larger population studies totaling thousands of children and conducted in several countries, including the US. These studies found that MMR vaccine is not responsible for a rise in autism. It is also important to note, that 10 of the 13 authors of the 1998 *Lancet* study have withdrawn their support of the article. In 2010, the British General Medical Council found the lead author of the study guilty of professional misconduct, the *Lancet* retracted the 1998 article, and the study's lead author has lost his license to practice medicine in the UK. Further, in January 2011, the *British Medical Journal (BMJ)* published a series of articles that conclude that the data in the 1998 study were misrepresented or altered.

## questions and answers

### Reputable scientific studies have found no link between MMR vaccine and autism. So, why do some people think that MMR vaccine causes autism?

There are a couple of reasons for this. Some parents of children with autism say they first noticed signs of autism a few days, weeks, or months after their child received MMR vaccine. They usually explain that their child was developing normally, and then signs of autism appeared after MMR vaccination.

Sometimes, signs of autism do not appear until around the age that the first dose of MMR is given. Some toddlers who have turned 1 year old—or even 2 or 3 years old—regress. That is, they lose the ability to do things that they once were able to do. If regression follows a memorable event like a trip to the doctor for vaccinations, this may seem like cause and effect.

### What's the harm in delaying the first MMR shot until my child is age 2 or older?

The MMR vaccine is recommended to be given during ages 12 months through 15 months. If you wait to give it later, your child could get measles, mumps, and/or rubella. Unfortunately,



all of these diseases remain a threat in the United States. For example, in 2008, there were 140 measles cases in the United States, more than any year since 1996. Seventeen of those cases were in children younger than 12 months old—too young to be vaccinated according to the routine recommendation. Another 9 were in unvaccinated 12- through 15-month-olds—the age when the vaccine is recommended. And 72 cases were in children and teens 16 months old through 19 years old who had not received the vaccine. Eight children younger than 2 years old and 9 adults were so seriously ill that they required hospitalization. Following U.S. recommendations for using MMR vaccine is the best way to protect children from these diseases and avoid outbreaks.

### How effective is MMR vaccine?

The vaccine is so effective that the United States eliminated measles in 2000. *Elimination* means that, even if measles is introduced into a community, it cannot spread to very many people. Elimination is possible when enough people are immune to a disease because of vaccination.

But, measles is still common in other parts of the world. Since people from the United States and other countries frequently travel internationally, we must keep MMR vaccination rates in the United States high. Even if your family does not travel, you could come into contact with international travelers anywhere in your community, from the grocery store to a sporting event. The United Kingdom had eliminated measles, but then MMR vaccination rates fell. Now, measles is once again spreading in that country.

### Some people think that the vaccine preservative thimerosal is dangerous. Is there thimerosal or mercury in MMR vaccine?

No. The MMR vaccine never has contained thimerosal or any other form of mercury. Furthermore, there is no evidence that thimerosal in vaccines is harmful.

### How long has MMR vaccine been in use?

The measles component in MMR vaccine that we use today has been in use since 1968, the mumps vaccine since 1967, and the rubella vaccine since 1979. All of these vaccines replaced earlier versions. Today's versions are safer, provide longer-lasting protection, and have fewer side effects.

### What are the known side effects of MMR vaccine?

Mild problems include fever (about 1 person out of 6), mild rash (about 1 person out of 20), and swelling of the glands in the cheeks or neck (rare). Moderate problems include seizure caused by fever (about 1 out of 3,000 doses), and temporary low platelet count, which rarely can cause a bleeding disorder (about 1 out of

30,000 doses). Severe problems are rare. Severe allergic reaction happens less than 1 time per 1,000,000 vaccine doses.

### What are the causes of autism?

CDC and other agencies and organizations are conducting research to find out. Many doctors believe that genetics likely play a strong role.

Across the world, parents, doctors, and scientists are working together to find the causes of autism and the best ways to treat or prevent the symptoms. More information can be found on CDC's Autism Spectrum Disorders website at <http://www.cdc.gov/ncbddd/autism/>.

### | the science |

Here is a summary of 5 of the more than 20 reputable studies that have found no relationship between MMR vaccine and autism. These studies were selected for this sheet because they illustrate the variety of methods that have been used to investigate whether MMR vaccine is linked to autism.

**Lack of Association between Measles Virus Vaccine and Autism with Enteropathy: A Case-Control Study** by Mady Hornig et al. *PLoS ONE*. September 2008. Vol 3: page e3140. <http://www.plosone.org/article/info:doi/10.1371/journal.pone.0003140>.

**Age at First Measles-Mumps-Rubella Vaccination in Children with Autism and School-Matched Control Subjects: A Population-Based Study in Metropolitan Atlanta** by Frank DeStefano et al. *Pediatrics*. February 2004. Vol 113: pages 259-266. <http://pediatrics.aappublications.org/cgi/reprint/113/2/259>.

**Immunization Safety Review: Vaccines and Autism.** Institute of Medicine. The National Academies Press: 2004. <http://www.iom.edu/?id=20155&redirect=0>.

**A Population-Based Study of Measles, Mumps and Rubella Vaccination and Autism** by Kreesten Meldgaard Madsen et al. *New England Journal of Medicine*. November 7, 2002. Vol 347: pages 1477-1482. <http://content.nejm.org/cgi/reprint/347/19/1477.pdf>.

**Autism and Measles, Mumps, and Rubella Vaccine: No Epidemiological Evidence for a Causal Association** by Brent Taylor et al. *The Lancet*. June 12, 1999. Vol 353: pages 2026-2029. <http://www.freenetpages.co.uk/hp/gingernut/lancet/Brent%20Taylor%20June%201999.pdf>.

For more information on vaccines call 800-CDC-INFO (800-232-4636) or visit <http://www.cdc.gov/vaccines>.